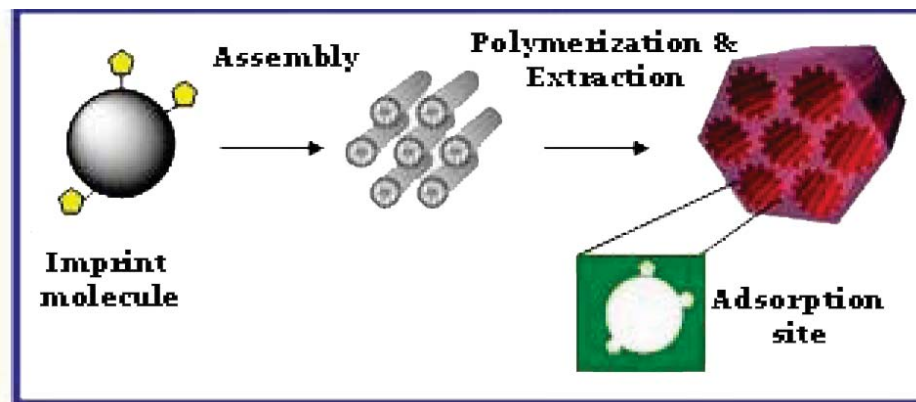# Selectively Absorbent Materials for Concentration and Detection

DESCRIPTION:

The Naval Research Laboratory (NRL) has developed in-house expertise and intellectual property for production of environmentally stable materials capable of selectively absorbing chemical agents. Techniques include, alone or in combination, the use of surfactant templates and molecular imprinting, to produce selectively adsorbing nanoporous organosilicas with engineered porosity. These materials have been shown to be effective at absorbing phenolic compounds and TNT.

The U.S. Navy is developing two technologies in this area, supported by several patents. The first technology pertains to the removal of chemical agents with an arylene-bridged (and derivatives thereof) organic-inorganic polymer adsorbent, with engineered porosity, and the regeneration of the loaded adsorbent. The second relates to a molecularly imprinted material made by template directed synthesis. Template directed molecular imprinting results in homogeneous adsorption sites that are specifically positioned for selective absorption. Combining these two technologies results in highly stable materials with enhanced adsorption selectivity and adsorption capacity.

ADVANTAGES/FEATURES:

- Absorptive characteristics similar to Granulated Activated Carbon (GAC)
- Highly selective
- Regeneration of the loaded adsorbent by alcohol wash and/or thermal desorption
- Licensable under U.S. Patents 6,673,246 on polysilsesquioxane adsorbents, and 6,310,110; 6,583,191; 6,660,780; and 6,713,416 on molecularly-imprinted materials

APPLICATIONS:

- Activated carbon replacement
- Sensor preconcentration
- Materials for environmental cleanup
- Air and water purification
- Protective barriers in fabric and clothing

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